

Appl. No. : 10/665,693
Filed : September 17, 2003

REMARKS

By way of summary, Claims 1-23 were previously pending. Claims 1, 10, and 14 are amended herein. Claim 21 has been canceled herein. Thus, Claims 1-20, 22, and 23 remain pending. In view of the following remarks, Applicants respectfully request entry of the amendments and reconsideration of the claims.

Response to Rejection Under 35 U.S.C. §112, Second Paragraph

The Examiner rejected Claim 1 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicants respectfully submit that the presently pending claims comply with the requirements of 35 U.S.C. § 112, second paragraph.

Claim 1 recites, among other things, "a buffer station adjacent the first substrate handling chamber and located between the loadlock chamber and the front docking port." The specification discloses that "buffer station 30 is preferably located in a position between the FOUP 10 and the loadlock chamber 40." Specification, paragraph [0038] (emphasis added). As shown in Figure 1 of the present application, for example, the buffer station 30 is adjacent the first substrate handling chamber and located between the loadlock chamber 40 and the front docking port. Thus, Claim 1 apprises one of skill in the art of its scope and meets the requirements of 35 U.S.C. § 112, second paragraph, particularly when read in light of the Specification.

Claims 1-13 Are Allowable Over Cited References

The Examiner rejected Claims 1-13 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,481,956 issued to Hofmeister in view of U.S. Patent No. 6,395,094 issued to Tanaka et al. ("Tanaka"). Claims 14-16 and 18-23 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,989,346 issued to Hiroki in view of Tanaka. For the purpose of responding to this Office Action, Applicants assume that the Examiner on page 6, ninth full paragraph, actually meant to reject Claim 17 (not Claim 18) under U.S.C. § 103 as being unpatentable over Hiroki. If Applicants' understanding is incorrect, the Examiner is respectfully requested to contact the Applicants' representatives. Applicants respectfully submit

Appl. No. : 10/665,693
Filed : September 17, 2003

that the presently pending claims are patentable over the cited references as discussed in detail below.

Claims 1-9 and 11-13

Amended Claim 1 recites:

A semiconductor processing tool comprising:
a first substrate handling chamber;
a front docking port located on the outside surface of the first substrate handling chamber;
a robot arm located in the first substrate handling chamber;
a loadlock chamber joined to the first substrate handling chamber; and
a buffer station adjacent the first substrate handling chamber and located between the loadlock chamber and the front docking port, the buffer station being configured to provide a less contaminated inert internal environment as compared with the internal environment of a cassette docked to the docking port, the buffer station having a rack configured to have multiple shelves for holding substrates, *wherein the buffer station is dimensioned and configured to hold more substrates than the loadlock chamber.*

The cited references, either individually or in combination, do not teach or suggest the unique combination of limitations recited by amended Claim 1. Claim 1 recites, among other things, that the buffer station is dimensioned and configured to hold more substrates than the loadlock chamber. In contrast to Claim 1, Hofmeister discloses buffers and load locks that have the same holding capacity. In particular, Hofmeister teaches that "the number of individual substrate holding areas in each buffer is the same as the number of individual substrate holding areas in each load lock." Col. 3, lines 41-44 (emphasis added). Hofmeister further teaches that "[s]ubstrates are moved 94 from the A load lock to the buffer B1; thereby emptying the A load lock of processed substrates and filling the B1 buffer." Col. 6, lines 23-25; see Figure 6. Thus, Hofmeister does not teach or suggest that the buffer station is dimensioned and configured to hold more substrates than the loadlock chamber.

Tanaka does not teach or suggest the deficiencies of Hofmeister. Tanaka does not disclose the recited combination of buffer parts and a load lock chamber. As shown in Figures 1a and 1b of Tanaka, the cited processing system has buffer parts 44, 46 but no load lock chambers. Hence, Tanaka also does not suggest a buffer station dimensioned and configured to hold more substrates than a load lock chamber. Accordingly, Hofmeister and Tanaka, either individually or in combination, do not teach or suggest each and every limitation of Claim 1.

Appl. No. : 10/665,693
Filed : September 17, 2003

Dependant Claims 2-9 and 11-13 are patentably distinguished over the cited references for at least the reasons with respect to Claim 1 as well as for novel and nonobvious features recited therein. Thus, Claims 1-9 and 11-13 are in condition for allowance.

Claim 10

Claim 10 has been amended into independent form and has the same scope as Claim 10 as set forth in the Amendment filed on March 21, 2005. Amended Claim 10 recites:

A semiconductor processing tool comprising:
a first substrate handling chamber;
a front docking port located on the outside surface of the first substrate handling chamber;
a robot arm located in the first substrate handling chamber;
a loadlock chamber joined to the first substrate handling chamber; and
a buffer station located between the loadlock chamber and the front docking port, the buffer station being configured to provide a less contaminated inert internal environment as compared with the internal environment of a cassette docked to the docking port, the buffer station having a rack configured to have multiple shelves for holding substrates, wherein the shelves of the buffer station rack have a reduced pitch relative to shelves of a front opening unified pod (FOUP) for the same size substrates.

The cited references, either individually or in combination, do not teach or suggest each and every limitation of Claim 10. Claim 10 recites, among other things, that the shelves of the buffer station rack have a reduced pitch relative to shelves of a front opening unified pod (FOUP) for the same size substrates. In contrast to Claim 10, Hofmeister discloses that "buffers B1-B4 are preferably designed to support a plurality of the substrates individually in a spaced stack similar to the cassettes 34." Col. 3, lines 33-46 (emphasis added). There is simply no teaching or suggestion for having different pitches between the buffers and the cassettes, let alone a reduced pitch of the buffer station relative to the shelves.

The Office Action states that "Hofmeister discloses variable spacing depending on the amount of wafer holding shelves require in the buffer." Office Action, page 4, seventh full paragraph. However, Applicants have studied Hofmeister and are unable to locate any such teachings. Additionally, Claim 10 recites relative pitches between the buffer station and the FOUP, which is not merely variable spacing. As discussed above, Hofmeister teaches away from having a buffer station rack with a reduced pitch relative to shelves of a front opening unified pod because it teaches having similar spaced stacks of substrates in the buffers and cassettes.

Appl. No. : 10/665,693
Filed : September 17, 2003

Tanaka does not teach or suggest the deficiencies of Hofmeister. For example, Tanaka also fails to teach or suggest configuring the shelves of the buffer station rack to have a reduced pitch relative to shelves of a front opening unified pod for the same size substrates. Thus, Claim 10 is in condition for allowance.

Claims 14-23

The limitations of canceled Claim 21 have been incorporated into Claim 14. Amended Claim 14 recites:

A semiconductor processing tool comprising:
a substrate handling chamber;
a front docking port located on an outside surface of the substrate handling chamber, the port being capable of mating with a cassette;
a cassette rack internal to the docked cassette;
a purgeable buffer station joined with and adjacent the substrate handling chamber, the buffer station being located in position downstream of the front docking port;
a buffer station rack within the buffer station being configured to have multiple slots for holding substrates; and
wherein the buffer station rack has a reduced relative spacing between the rack slots as compared with a relative spacing between slots of the cassette.

The cited references, either individually or in combination, do not teach or suggest the unique combination of limitations recited by amended Claim 14. Claim 14 recites, among other things, that the buffer station rack has a reduced relative spacing between the rack slots as compared with a relative spacing between slots of the cassette. Neither Hiroki nor Tanaka teach or suggest this feature. For example, Hiroki teaches a frame 70 that includes four buffers 72, 74, 76, and 78. Hiroki does not disclose a relationship between the frame 70 and slots in a cassette, let alone the spacing between the buffer station and the slots of the cassette, as recited by Claim 14. The cited references simply do not teach or suggest the buffer station rack that has a reduced relative spacing between the rack slots as compared with a relative spacing between slots of the cassette. Accordingly, Claim 14 is in condition for allowance.

Additionally, as noted in the previously filed amendment, Hiroki does not disclose or suggest a front docking port located on an outside surface of the substrate handling chamber, the port being capable of mating with a cassette, as recited in Claim 14. As shown in Figure 2 of

Appl. No. : 10/665,693
 Filed : September 17, 2003

Hiroki (reproduced below), the docking port 9b is not on an outside surface of the handling chamber 5, but rather on an outside surface of the load lock chamber 3.

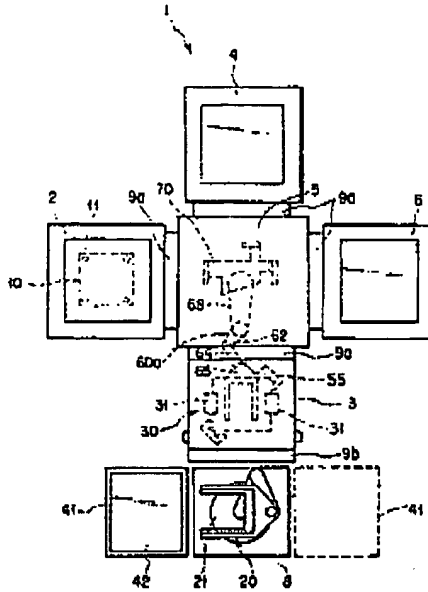


FIG. 2

As shown above, the substrate handling chamber 5 has gate valves 9a on an outside surface, but they are not capable of mating with the cassette 42. The illustrated cassette 42 is spaced from the load lock chambers 3, and the transfer mechanism 20 is disposed outside of the gate valve 9b. Accordingly, because the cited references do not teach or suggest each and every limitation of Claim 14, Applicants respectfully submit that Claim 14 is in condition for allowance.

Tanaka does not teach or suggest the deficiencies of Hiroki. For example, Tanaka also fails to teach or suggest the buffer station rack with a reduced relative spacing between the rack slots as compared with a relative spacing between slots of the cassette. Thus, Claim 14 is in condition for allowance.

Dependant Claims 15-23 are patentably distinguished over the cited references for at least the reasons with respect to Claim 14 as well as for novel and nonobvious features recited therein. Thus, Claims 14-23 are in condition for allowance.

Appl. No. : 10/665,693
Filed : September 17, 2003

Conclusion

For the foregoing reasons, it is respectfully submitted that the rejections set forth in the outstanding Office Action are inapplicable to the present claims. Accordingly, early issuance of a Notice of Allowance is most earnestly solicited.

Applicants do not agree with the characterization of the references nor with the rejection of the claims set forth by the Examiner. Nevertheless, to expedite the issuance of the other pending claims, Applicants have amended Claims 1, 10, and 14 to more clearly distinguish the pending claims over the cited references. In view of the foregoing clarifying amendments, Applicants do not present arguments concerning the combinability of the cited references. Applicants hereby reserve the right to contest the combinability of these references at a later date. Applicants also reserve the right to pursue at a later date claims similar to the original claims.

Any remarks in support of patentability of one claim should not be imputed to any other claim, even if similar terminology is used. Any remarks referring to only a portion of a claim should not be understood to base patentability on solely that portion; rather, patentability must rest on each claim taken as a whole. Applicants have not presented arguments concerning whether the applied references can be properly combined in view of the clearly missing elements noted above, and Applicants reserve the right to later contest whether a proper motivation and suggestion exists to combine these references.

The undersigned has made a good faith effort to respond to all of the rejections in the case and to place the claims in condition for immediate allowance. Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: January 23, 2006

By: Karl L. Klassen
Karl L. Klassen
Registration No. 54,224
Attorney of Record
Customer No. 20,995
(949) 760-0404

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